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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/598,388

08/25/2006

Thomas Pagel

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EXAMINER

HOLWERDA, STEPHEN CHRISTOPHER

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/598,388	Applicant(s) PAGEL ET AL.	
	Examiner STEPHEN HOLWERDA	Art Unit 4127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/25/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This communication is a First Office Action on the Merits. Claims 1-6, as amended 7 September 2006, are pending and have been considered as follows.

Information Disclosure Statement

1. The listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Report have not necessarily been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

Oath/Declaration

2. The declaration submitted 25 August 2006 is defective in that it has not been executed in accordance with either 37 CFR 1.66 or 1.68. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

Drawings

3. The drawings are objected to because: Figure 1 includes shading not in accordance with 37 CFR 1.84(m). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

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corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "frame 2" on page 7, line 22 is not present in the drawing figures.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

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The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to for the following reasons: (1) the abstract begins with "The invention relates to..."; (2) the abstract contains unacceptable legal phraseology such as "comprising"; and (3) the abstract exceeds 150 words.

Correction is required. See MPEP § 608.01(b).

7. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if

the required "Sequence Listing" is not submitted as an electronic document on compact disc).

8. The disclosure is objected to because of the following informalities: (1) the application omits the lettered items listed in 37 CFR 1.77(b); and (2) the term "hand surface 12" on page 8, line 35 is inconsistent with the term "hand flange 12" on page 9, line 3. Appropriate correction is required.

Claim Objections

9. Claim 4 is objected to because of the following informalities: the symbol "α" in line 3 is not in parentheses. Appropriate correction is required.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Kemp J., et al. (WIPO Publication No. 03/059580 A2). The following citations relied on the attached machine translation and refer to portions in the German language WIPO publication.

As per Claim 1, Kemp discloses a method for calibrating a tool center point (TCP) of tools (13) for industrial robots (8) comprising a calibration apparatus (1) (Figs. 1-4; page 5, line 7-22) that has at least two light barriers (6, 7) which are angled to one

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another with a vertex angle (α) greater than zero in each case and cross one another at a crossing point (R) (Figs. 1-2; page 7, line 15 through page 8, line 2; intersecting light barriers inherently cross at an angle), exhibiting the steps of: a) fixing DESIRED TCP positional coordinates of a DESIRED tool center point ($TCP_{DESIRED}$) of the tool (13) with reference to a tool reference point (W) of an industrial robot (8), and to a TCP coordinate system referred to the tool center point (TCP) (Fig. 3; page 8, line 16 through page 9, line 8), and b) moving the tool (13) directly to the DESIRED tool center point with reference to the TCP coordinate system through the light barriers such that the tip of the tool (13) corresponding to the tool center point (TCP) interrupts the light barriers (Figs. 3; page 9, line 10-26), characterized by c) recording ACTUAL TCP positional coordinates upon the interruption of a respective light barrier (Fig. 4; page 9, line 28 through page 10, line 8), d) determining the differences between the DESIRED TCP positional coordinates for the interruption of the light barriers at a DESIRED tool center point ($TCP_{DESIRED}$) and the corresponding recorded ACTUAL TCP positional coordinates for the ACTUAL tool center point (TCP_{ACTUAL}) (page 9, line 28 through page 10, line 8), and e) calculating the deviation of the ACTUAL tool center point (TCP_{ACTUAL}) from the DESIRED tool center point ($TCP_{DESIRED}$) for the number of planes that is prescribed by the light barriers from the differences and the known position and vertex angles (α) for the light barriers (page 9, line 10 through page 10, line 8).

As per Claim 2, Kemp further discloses correcting the TCP positional coordinates by the calculated deviation between the fixed ACTUAL TCP position coordinates by the calculated deviation of the ACTUAL tool center point (TCP_{ACTUAL}) from the DESIRED

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tool center point ($TCP_{DESIRED}$) for the planes of a coordinate system, on which the TCP positional coordinates are based (Figs. 3-4; page 9, line 10 through page 10, line 8; new operating point TCP based on corrected operating point of worn tool).

As per Claim 3, Kemp further discloses the DESIRED tool center point ($TCP_{DESIRED}$) is fixed with the aid of the TCP positional coordinates in the case of which the tool tip corresponding to the tool center point (TCP) simultaneously interrupts all the light barriers at a common crossing point (R) (Figs. 3-4; page 9, line 10 through page 10, line 8; correction of tool operating point determined via reference crossover R).

As per Claim 4, Kemp further discloses two light barriers being provided that cross one another at a vertex angle (α) of 90 (Figs. 1-2; page 8, line 4-7; angle inherent at intersection of light barrier beams) and define a first plane of a coordinate system, and with the first light barrier corresponding to a first axis (y), and the second light barrier corresponding to a second axis (z) of the coordinate system (page 6, line 15-28; theoretical coordinate system inherent property of crossed beams), characterized in that the deviation of the tool center point (TCP) for the first axis (y) is determined from the deviation, determined upon interruption of the first light barrier, of the ACTUAL tool center point (TCP_{ACTUAL}) from the DESIRED tool center point ($TCP_{DESIRED}$), and the deviation of the tool center point (TCP) for the second axis (z) is determined from the deviation, determined upon interruption of the second light barrier, of the ACTUAL tool center point (TCP_{ACTUAL}) from the DESIRED tool center point ($TCP_{DESIRED}$) (Figs. 3-4; page 9, line 10 through page 10, line 8; new operating point TCP based on corrected operating point of worn tool and reference crossover R).

As per Claim 5, Kemp further discloses determining the ACTUAL TCP position coordinates as mean ACTUAL TCP positional coordinates between the instant of the interruption of a light barrier and the subsequent release of the light barrier (page 8, line 9-14; page 9, line 10 through page 10, line 8; new operating point TCP based on corrected operating point of worn tool and reference crossover R).

As per Claim 6, Kemp further discloses determining the tool diameter from the difference of the ACTUAL TCP positional coordinates determined at the instant of the interruption of a light barrier and the subsequent release of the light barrier (page 8, line 9-14; page 9, line 28 through page 10, line 8; "determining tool diameter" inherent in determining whether tool has become worn).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tucker et al. (US Patent No. 4,662,752), Red et al. (US Patent No. 4,831,549); and Ravani et al. (US Patent No. 5,740,328) discuss methods for calibrating tools.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN HOLWERDA whose telephone number is (571) 270-5747. The examiner can normally be reached on M-F 7:30-5:00; alternate F off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynda Jasmin can be reached on (571) 272-6782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/sh/
Examiner
Art Unit 4127

/Lynda Jasmin/

Supervisory Patent Examiner, Art Unit 4127